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| 10/719,585 | 11/21/2003 | Tim Sievers | 04087-P0001A | 3272 |

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| EXAMINER | |
|---|---|
| DANIELS, MATTHEW J | |
| ART UNIT | PAPER NUMBER |
| 1732 | |

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
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| 3 MONTHS | 04/18/2007 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/719,585 | SIEVERS ET AL. | |
| | Examiner | Art Unit | |
| | Matthew J. Daniels | 1732 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *29 January 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-5,7 and 8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,7 and 8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *11/6/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Priority*

1. Acknowledgment is made of applicant's claim for foreign priority based on application DE 101 24 795.8, filed on 21 May 2001. It is noted, however, that applicant has not filed a certified copy of the German application as required by 35 U.S.C. 119(b).

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. **Claims 1, 2, 4, 5, 7 and 8** are rejected under 35 U.S.C. 103(a) as being unpatentable over Benda (USPN 5427733) in view of Herfurth (DE 19533960, of record). **As to Claim 1**, Benda teaches a method for producing a work piece by the successive compacting by electromagnetic radiation of powdered starting material in horizontal layers (3:66-4:40), each layer consisting of a horizontal surface and two substantially vertical lateral faces which form the basis for a possible subsequent layer (Fig. 2, Item 63 and 1:45-57). The part being surrounded by powder during fabrication would be an inherent aspect of the selective laser sintering process taught by Benda. In the method of Benda, there is no teaching from the art that one should remove the powder between layers, and it would have been obvious to keep the powder in place to avoid the time wasted in removal of the powder. Benda is silent to the mechanical finishing aspects sought in the instant claims. However, they would have been prima facie obvious over Herfurth, who

teaches intermediate mechanical finishing of the $n^{th}$ layer after generation of the $n + x^{th}$ layer, and not being performed at the same time as mechanical finishing of the nth layer (Fig. 11, and 13:53-14:33). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Herfurth into that of Benda in order to save time by combining or simultaneously performing the compacting and milling steps, and to maintain an enlarged projecting edge to serve as a base for subsequent coating steps and retain heat. Additionally, rearrangement of process steps disclosed by the prior art is generally prima facie obvious in the absence of unexpected results. See MPEP 2144.04(IV)(C) and *Ex Parte Rubin*, 128 USPQ 440 (Bd. Pat. App. & Int. 1959).

**As to Claims 2, 4, and 5**, Herfurth's method fulfills the limitation of producing at least one further layer between the production of a layer and the mechanical finishing of it (Claim 2), several layers form a package (Claim 4), and mechanical finishing of a previous layer after the generation of the proceeding layer (Claim 5). **As to Claim 7**, Benda teaches providing at least one first horizontal layer of powdered starting material (1:54-65), compacting with a laser to form vertical lateral faces (1:66-2:23 and Fig. 2, Items 73 and 64), providing at least one second horizontal layer of powdered starting material (1:34-65, the process is repeated by Benda), and compacting with a laser to form a second trace with vertical faces (1:34-65 and Fig. 2, Items 73 and 64), the article remaining at all times surrounded by powder. In the method of Benda, there is no teaching from the art that one should remove the powder between layers, and it would have been obvious to keep the powder in place to avoid the time wasted in removal of the powder. Benda is silent to the mechanically finishing. However, Herfurth teaches mechanically finishing vertical sidewalls of the first trace but not the sidewalls of the at least second trace, while the at

least one first trace (Fig. 11, and 13:53-14:33). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Herfurth into that of Benda in order to save time by combining or simultaneously performing the compacting and milling steps, and to maintain an enlarged projecting edge to serve as a base for subsequent coating steps and to retain heat in the part. **As to Claim 8**, Benda teaches that the process of providing powdered material and compacting should continue repeatedly. In the method of Benda, there is no teaching from the art that one should remove the powder between layers, and it would have been obvious to keep the powder in place to avoid the time wasted in removal of the powder. Benda is silent to the mechanical finishing of the vertical sidewalls of the second trace. However, Herfurth teaches providing a third layer and finishing the vertical sidewalls of the second trace. It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Herfurth into that of Benda in order to save time by combining or simultaneously performing the compacting and milling steps, and to maintain an enlarged projecting edge to serve as a base for subsequent coating steps and to retain heat in the part.

3. **Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over Benda (USPN 5427733) in view of Herfurth (DE 19533960, of record), and further in view of Prinz (5207371). Benda and Herfurth teach the subject matter of Claim 1 above under 35 USC 103(a). **As to Claim 3**, Benda appears to be silent to the simultaneous finishing of several layers. However, Prinz teaches that multiple layers of a layered part can be milled simultaneously (Abstract). It would have been prima facie obvious to one of ordinary skill in the art at the time of the

invention to incorporate the method of Prinz into that of Benda in order to reduce the number of machining passes or to produce any desired configuration or contour (Prinz, 6:5-8) including undercuts and irregular shapes (Prinz, 3:30-31).

***Response to Arguments***

4. Applicant's arguments filed 1 January 2007 have been fully considered but they are not persuasive. The arguments appear to be on the following grounds:

a) The pending claims require the layers be surrounded with powdered starting material as they are mechanically finished. Clearly, such cannot be disclosed by Benda, since Benda is silent as to mechanical finishing.

b) Herfurth clearly and repeatedly teaches in column 10, lines 20-25 and 53-65 that powder that was not removed should, in fact, be removed between layers. It is well settled that the mere fact that the references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination or modification. Here there is no suggestion.

c) The modification would be contrary to the conventional wisdom of those skilled in the art. It is generally understood that it is undesirable to mechanically finish a compacted layer while the layer is still surrounded by powdered starting material, which would disturb the layers and make it more difficult to form subsequent layers.

d) Applicant's have invented a mechanical finishing tool which has a configuration which allows it to be dipped into the powdered starting material, and surprisingly provides a better finish than

previously known methods because the abrasiveness of the powdered starting materials surrounding the layers actually may enhance such finishing.

5. These arguments are not persuasive or are moot for the following reasons:

a) While Benda does not appear to teach mechanical finishing, it is not argued that mechanical finishing of such pieces is unknown or undesirable. Herfurth provides mechanical finishing, and the Examiner submits that it is generally desirable to provide finished, smooth, surfaces to articles, and particularly to articles fabricated by a layer deposition process. Thus, the Examiner submits that the steps of mechanical finishing and successive compaction are known and taught by the cited references.

b, d) With regard to the assertion that Herfurth requires a particular order of steps, namely removal before machining, it is submitted that rearrangement of the order of steps disclosed by the prior art is generally prima facie obvious. *Ex Parte Rubin*, 128 USPQ 440 (Bd. Pat. App. & Int. 1959). Also see MPEP 2144.04(IV)(C). *Rubin* is particularly relevant to this case because it requires only steps of assembly, and not steps of mixing ingredients or chemical reactions. While Herfurth does teach one particular order of steps, Benda teaches that the layer must be surrounded by a powder layer prior to the application of the next layer in the deposition process.

With regard to the arguments that Applicant's have invented a new milling tool which causes less powder disturbance and surprisingly provides a better finish than previously known methods because the abrasiveness of the powdered starting materials surrounding the layers actually *may* enhance finishing, it is noted that the particular milling tool argued has not been claimed, and there is no evidence presented to support the argument that abrasiveness of the

surrounding powder improves the surface finish. However, in the absence of such evidence, the instant claim may be characterized as a rearrangement of process steps disclosed by the prior art, and rearrangement of process steps disclosed by the prior art is generally prima facie obvious. *Ex Parte Rubin*, 128 USPQ 440 (Bd. Pat. App. & Int. 1959). Also see MPEP 2144.04(IV)(C). In this case, evidence that the surrounding powder provides an abrasive action which surprisingly improves the finishing process may provide persuasive evidence that the claimed invention cannot be characterized merely as a rearrangement of process steps well known in the prior art.

c) Disturbance of the powder is cited as the reason that the particular order of steps would be contrary to the conventional wisdom of those skilled in the art, however, the arguments do not appear to consider Benda's teaching that the roller (Fig. 1, item 68) reapplies powder before each step of compacting with radiation, and would therefore appear to resolve any powder disturbances immediately prior to each laser cycle.

### *Conclusion*

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Daniels whose telephone number is (571) 272-2450. The examiner can normally be reached on Monday - Friday, 8:00 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on (571) 272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MJD 4/16/07

MJD

CHRISTINA JOHNSON
SUPERVISORY PATENT EXAMINER
4/16/07